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rptmr scaled 20000 [Numerical simulations of interacting gas-rich barred galaxies] Numerical simulations of interacting gas-rich barred galaxies. Vertical impact of small companions. [I. Berentzen et al.]

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abstract We investigate the dynamical effects of an interaction between an initially barred galaxy and a small spherical companion using an N-body/SPH algorithm. In the models described here the small companion passes through the disc of the larger galaxy near-perpendicular to its plane. The impact positions and times are varied with respect to the phase of the bar and the dynamical evolution of the disc.

The interactions produce expanding ring structures, offset bars, spokes, and other asymmetries in the stars and gas. These characteristic signatures of the interaction are present in the disc for about 1 $Gyr. We find that in some cases it is possible to destroy the bar while keeping the disc structure. In general the central impacts cause barred galaxy. The final disc morphology is determined more by the impact position relative to the bar rather than the impact time.$